AMENDMENT TO THE CLAIMS:

1. (Previously Presented) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, and wherein the solid aggregate of bone-derived elements possesses a compression strength of from about 10 to about 200 MPa.

2. (Previously presented) The osteoimplant of Claim 1 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

3. (Previously presented) The osteoimplant of Claim 1 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

4. (Previously presented) The osteoimplant of Claim 1 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the filler being selected from

the group consisting of hydroxyapatite, tricalcium phosphate, other calcium salts, bioglass, bioceramic, bioabsorbable polymer, nonbioabsorbable material and mixtures thereof.

5. (Previously presented) The osteoimplant of Claim 1 containing an additional component selected from the group consisting of bone-growth inducing substance, growth factors, cellular material, genetic material, calcification-controlling agent and hydration agent.

6. (Original) The osteoimplant of Claim 1 possessing a cross section for at least a portion of its length which is, or approximates, a circle, oval or polygon, the implant optionally possessing a cavity for at least a portion of its length.

D1 Cont

7. (Original) The osteoimplant of Claim 1 wherein the chemical linkages are formed by chemical crosslinking, application of energy, dehydrothermal treatment or enzymatic treatment.

8. (Cancelled)

9. (Original) The osteoimplant of Claim 1 possessing a hydration-facilitating agent.

10. (Previously presented) The osteoimplant of Claim 9 wherein the hydration-facilitating agent is glycerol.

11. (Previously presented) The osteoimplant of Claim 1 wherein the chemical linkages are formed by exposing the bone-derived elements to a chemical crosslinking agent.

12. (Original) The osteoimplant of Claim 11 wherein the chemical crosslinking agent is selected from the group consisting of monoaldehydes, dialdehydes, polyepoxy

compounds, polyvalent metallic oxides, organic tannins, phenolic oxides derived from plants, hydrazide, dicyclohexyl carbodiimide, hexamethylene diisocyanate, sugars and enzymes.

13. (Original) The osteoimplant of Claim 11 wherein the bone-derived elements are exposed to the chemical crosslinking agent by placing the bone-derived elements in a solution of chemical crosslinking agent.

14. (Original) The osteoimplant of Claim 11 wherein the bone-derived elements are exposed to the chemical crosslinking agent by exposing the bone-derived elements to vapors of the chemical crosslinking agent.

15. (Original) The osteoimplant of Claim 11 wherein the chemical crosslinking agent is a polyepoxy compound.

16. (Original) The osteoimplant of Claim 11 wherein the chemical crosslinking agent is a monoaldehyde or dialdehyde.

17. (Original) The osteoimplant of Claim 11 wherein the chemical crosslinking agent is formalin.

18. (Original) The osteoimplant of Claim 11 wherein the chemical crosslinking agent is polyethylene glycol diglycidyl ether.

19. (Previously presented) The osteoimplant of Claim 11 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets or allogenic, xenogenic cortical or cancellous bone.

20. (Previously presented) The osteoimplant of Claim 11 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or

sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

21. (Previously presented) The osteoimplant of Claim 11 containing an additional component selected from the group consisting of bone-growth inducing substances, growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

Claim 22 (Cancelled)

23. (Original) The osteoimplant of Claim 11 wherein the solid aggregate of bone-derived elements possesses a compression strength of from about 20 to about 200 MPa.

24. (Previously presented) The osteoimplant of Claim 11 wherein the bone-derived elements are superficially demineralized or substantially fully demineralized sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone.

25. (Original) The osteoimplant of Claim 24 wherein each sheet is approximately 1.5 mm thick.

26. (Original) The osteoimplant of Claim 24 wherein the sheets are assembled into a layered structure prior to exposing the sheets to a chemical crosslinking agent.

27. (Original) The osteoimplant of Claim 24 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

28. (Original) The osteoimplant of Claim 24 wherein at least one of the sheets is fully demineralized.

29. (Original) The osteoimplant of Claim 24 wherein at least one of the sheets is coated with demineralized bone powder.

30. (Original) The osteoimplant of Claim 26 possessing a total thickness of from about 2 to about 20 mm.

31. (Original) The osteoimplant of Claim 24 configured and dimensioned as a square or rectangle.

32. (Original) The osteoimplant of Claim 24 configured and dimensioned as a cylinder.

D' Cont

33. (Previously presented) The osteoimplant of Claim 24 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

34. (Original) The osteoimplant of Claim 11 wherein the solid aggregate of bone-derived elements possesses a network of pores, perforations, apertures, channels, or spaces.

35. (Previously presented) The osteoimplant of Claim 34 having incorporated therein one or more bone growth inducing or bone healing substances.

36. (Previously presented) The osteoimplant of Claim 1 wherein the chemical linkages are formed by application of energy.

37. (Original) The osteoimplant of Claim 36 wherein the energy is heat.

38. (Original) The osteoimplant of Claim 36 wherein the energy is radiant energy.

39. (Original) The osteoimplant of Claim 36 wherein the energy is ultraviolet light or microwave energy.

40. (Original) The osteoimplant of Claim 36 wherein the application of energy comprises dye-mediated photo-oxidation.

41. (Previously presented) The osteoimplant of Claim 36 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

42. (Previously presented) The osteoimplant of Claim 36 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

43. (Previously presented) The osteoimplant of Claim 36 containing an additional component selected from the group consisting of bone-growth inducing substances, growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

Claim 44 (Cancelled)

45. (Original) The osteoimplant of Claim 36 wherein the solid aggregate of bone-derived elements possesses a compression strength of from about 20 to about 200 MPa.

46. (Original) The osteoimplant of Claim 36 wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone.

47. (Original) The osteoimplant of Claim 46 wherein each sheet is approximately 1.5 mm thick.

48. (Original) The osteoimplant of Claim 46 wherein the sheets are assembled into a layered structure prior to applying energy to the sheets.

49. (Original) The osteoimplant of Claim 46 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

50. (Original) The osteoimplant of Claim 46 wherein at least one of the sheets is fully demineralized.

D1 Cont

51. (Original) The osteoimplant of Claim 46 wherein at least one of the sheets is coated with demineralized bone powder.

52. (Original) The osteoimplant of Claim 48 possessing a total thickness of from about 2 to about 20 mm.

53. (Original) The osteoimplant of Claim 46 configured and dimensioned as a square or rectangle.

54. (Original) The osteoimplant of Claim 46 configured and dimensioned as a cylinder.

55. (Previously presented) The osteoimplant of Claim 46 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

56. (Original) The osteoimplant of Claim 36 wherein the solid aggregate of bone-derived elements possesses a network of pores, perforations, apertures, channels, or spaces.

57. (Original) The osteoimplant of Claim 56 wherein the pores, perforations, apertures, channels or spaces have incorporated therein one or more bone growth inducing or bone healing substances.

58. (Previously presented) The osteoimplant of Claim 1 wherein the chemical linkages are formed by dehydrothermal treatment.

59. (Previously presented) The osteoimplant of Claim 58 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

D' Cont

60. (Previously presented) The osteoimplant of Claim 58 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

61. (Previously presented) The osteoimplant of Claim 58 containing an additional component selected from the group consisting of bone-growth inducing substances, growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

Claim 62 (Cancelled)

63. (Original) The osteoimplant of Claim 58 wherein the solid aggregate of bone-derived elements possesses a compression strength of from about 20 to about 200 MPa.

64. (Original) The osteoimplant of Claim 58 wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone.

65. (Original) The osteoimplant of Claim 64 wherein each sheet is approximately 1.5 mm thick.

66. (Original) The osteoimplant of Claim 64 wherein the sheets are assembled into a layered structure prior to subjecting the sheets to dehydrothermal treatment.

67. (Original) The osteoimplant of Claim 64 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

D 1 Cont

68. (Original) The osteoimplant of Claim 64 wherein at least one of the sheets is fully demineralized.

69. (Original) The osteoimplant of Claim 64 wherein at least one of the sheets is coated with demineralized bone powder.

70. (Original) The osteoimplant of Claim 66 possessing a total thickness of from about 2 to about 20 mm.

71. (Original) The osteoimplant of Claim 64 configured and dimensioned as a square or rectangle.

72. (Original) The osteoimplant of Claim 64 configured and dimensioned as a cylinder.

73. (Previously presented) The osteoimplant of Claim 64 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

74. (Original) The osteoimplant of Claim 58 wherein the solid aggregate of bone-derived elements possesses a network of pores, perforations, apertures, channels, or spaces.

75. (Original) The osteoimplant of Claim 74 wherein the pores, perforations, apertures, channels or spaces have incorporated therein one or more bone growth inducing or bone healing substances.

76. (Previously presented) The osteoimplant of Claim 1 wherein the chemical linkages are formed by enzymatic treatment.

77. (Original) The osteoimplant of Claim 76 wherein the enzymatic treatment comprises tissue transglutaminase.

78. (Previously presented) The osteoimplant of Claim 76 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

79. (Previously presented) The osteoimplant of Claim 76 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

80. (Previously presented) The osteoimplant of Claim 76 containing an additional component selected from the group consisting of bone-growth inducing substances, growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

Claim 81 (Cancelled)

82. (Original) The osteoimplant of Claim 76 wherein the solid aggregate of bone-derived elements possesses a compression strength of from about 20 to about 200 MPa.

83. (Original) The osteoimplant of Claim 76 wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone.

D1 Cont

84. (Original) The osteoimplant of Claim 83 wherein each sheet is approximately 1.5 mm thick.

85. (Original) The osteoimplant of Claim 83 wherein the sheets are assembled into a layered structure prior to subjecting the sheets to enzymatic treatment.

86. (Original) The osteoimplant of Claim 83 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

87. (Original) The osteoimplant of Claim 83 wherein at least one of the sheets is fully demineralized.

88. (Original) The osteoimplant of Claim 83 wherein at least one of the sheets is coated with demineralized bone powder.

89. (Original) The osteoimplant of Claim 85 possessing a total thickness of from about 2 to about 20 mm.

90. (Original) The osteoimplant of Claim 83 configured and dimensioned as a square or rectangle.

91. (Original) The osteoimplant of Claim 83 configured and dimensioned as a cylinder.

92. (Previously presented) The osteoimplant of Claim 83 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

93. (Original) The osteoimplant of Claim 76 wherein the solid aggregate of bone-derived elements possesses a network of pores, perforations, apertures, channels, or spaces.

D1 Cont

94. (Original) The osteoimplant of Claim 93 wherein the pores, perforations, apertures, channels or spaces have incorporated therein one or more bone growth inducing or bone healing substances.

95. (Previously presented) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component

selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are superficially demineralized or substantially fully demineralized sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the chemical linkages are formed by exposing the bone-derived elements to a chemical crosslinking agent.

96. (Previously presented) The osteoimplant of Claim 95 wherein each sheet is approximately 1.5 mm thick.

97. (Previously presented) The osteoimplant of Claim 95 wherein the sheets are assembled into a layered structure prior to exposing the sheets to a chemical crosslinking agent.

98. (Previously presented) The osteoimplant of Claim 95 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

99. (Previously presented) The osteoimplant of Claim 95 wherein at least one of the sheets is fully demineralized.

100. (Previously presented) The osteoimplant of Claim 95 wherein at least one of the sheets is coated with demineralized bone powder.

101. (Previously presented) The osteoimplant of Claim 97 possessing a total thickness of from about 2 to about 20 mm.

102. (Previously presented) The osteoimplant of Claim 95 configured and dimensioned as a square or rectangle.

103. (Previously presented) The osteoimplant of Claim 95 configured and dimensioned as a cylinder.

104. (Previously presented) The osteoimplant of Claim 95 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

105. (Previously presented) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the chemical linkages are formed by application of energy.

D1 Cont

106. (Previously presented) The osteoimplant of Claim 105 wherein each sheet is approximately 1.5 mm thick.

107. (Previously presented) The osteoimplant of Claim 105 wherein the sheets are assembled into a layered structure prior to applying energy to the sheets.

108. (Previously presented) The osteoimplant of Claim 105 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

109. (Previously presented) The osteoimplant of Claim 105 wherein at least one of the sheets is fully demineralized.

110. (Previously presented) The osteoimplant of Claim 105 wherein at least one of the sheets is coated with demineralized bone powder.

111. (Previously presented) The osteoimplant of Claim 107 possessing a total thickness of from about 2 to about 20 mm.

112. (Previously presented) The osteoimplant of Claim 105 configured and dimensioned as a square or rectangle.

113. (Previously presented) The osteoimplant of Claim 105 configured and dimensioned as a cylinder.

D' Cont

114. (Previously presented) The osteoimplant of Claim 105 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

115. (Previously presented) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized

bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the chemical linkages are formed by dehydrothermal treatment.

116. (Previously presented) The osteoimplant of Claim 115 wherein each sheet is approximately 1.5 mm thick.

117. (Previously presented) The osteoimplant of Claim 115 wherein the sheets are assembled into a layered structure prior to subjecting the sheets to dehydrothermal treatment.

118. (Previously presented) The osteoimplant of Claim 115 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

D' Cont

119. (Previously presented) The osteoimplant of Claim 115 wherein at least one of the sheets is fully demineralized.

120. (Previously presented) The osteoimplant of Claim 115 wherein at least one of the sheets is coated with demineralized bone powder.

121. (Previously presented) The osteoimplant of Claim 117 possessing a total thickness of from about 2 to about 20 mm.

122. (Previously presented) The osteoimplant of Claim 115 configured and dimensioned as a square or rectangle.

123. (Previously presented) The osteoimplant of Claim 115 configured and dimensioned as a cylinder.

124. (Previously presented) The osteoimplant of Claim 115 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

125. (Previously presented) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the chemical linkages are formed by enzymatic treatment.

D1 Cont

126. (Previously presented) The osteoimplant of Claim 125 wherein each sheet is approximately 1.5 mm thick.

127. (Previously presented) The osteoimplant of Claim 125 wherein the sheets are assembled into a layered structure prior to subjecting the sheets to enzymatic treatment.

128. (Previously presented) The osteoimplant of Claim 125 wherein at least one of the sheets possesses a fully or partially demineralized outer surface and a nondemineralized or partially demineralized core.

129. (Previously presented) The osteoimplant of Claim 125 wherein at least one of the sheets is fully demineralized.

130. (Previously presented) The osteoimplant of Claim 125 wherein at least one of the sheets is coated with demineralized bone powder.

131. (Previously presented) The osteoimplant of Claim 127 possessing a total thickness of from about 2 to about 20 mm.

132. (Previously presented) The osteoimplant of Claim 125 configured and dimensioned as a square or rectangle.

133. (Previously presented) The osteoimplant of Claim 125 configured and dimensioned as a cylinder.

134. (Previously presented) The osteoimplant of Claim 125 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

135. (New) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through covalent chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized

bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, and wherein the solid aggregate of bone-derived elements possesses a compression strength of from about 10 to about 200 MPa.

136. (New) The osteoimplant of Claim 1 wherein the covalent chemical linkages are formed by chemical crosslinking, application of energy, dehydrothermal treatment or enzymatic treatment.

137. (New) The osteoimplant of Claim 1 wherein the covalent chemical linkages are formed by exposing the bone-derived elements to a chemical crosslinking agent.

138. (New) The osteoimplant of Claim 1 wherein the covalent chemical linkages are formed by application of energy.

139. (New) The osteoimplant of Claim 1 wherein the covalent chemical linkages are formed by dehydrothermal treatment.

140. (New) The osteoimplant of Claim 1 wherein the covalent chemical linkages are formed by enzymatic treatment.

141. (New) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through covalent chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component

selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are superficially demineralized or substantially fully demineralized sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the covalent chemical linkages are formed by exposing the bone-derived elements to a chemical crosslinking agent.

142. (New) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through covalent chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the covalent chemical linkages are formed by application of energy.

D1 Cont'd

143. (New) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through covalent chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized

bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the covalent chemical linkages are formed by dehydrothermal treatment.

144. (New) An osteoimplant which comprises a solid aggregate of bone-derived elements selected from the group consisting of superficially demineralized bone-derived elements, substantially completely demineralized bone-derived elements and mixtures thereof, adjacent bone-derived elements being bonded to each other through covalent chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers, wherein the bone-derived elements are sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone, and wherein the covalent chemical linkages are formed by enzymatic treatment.

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